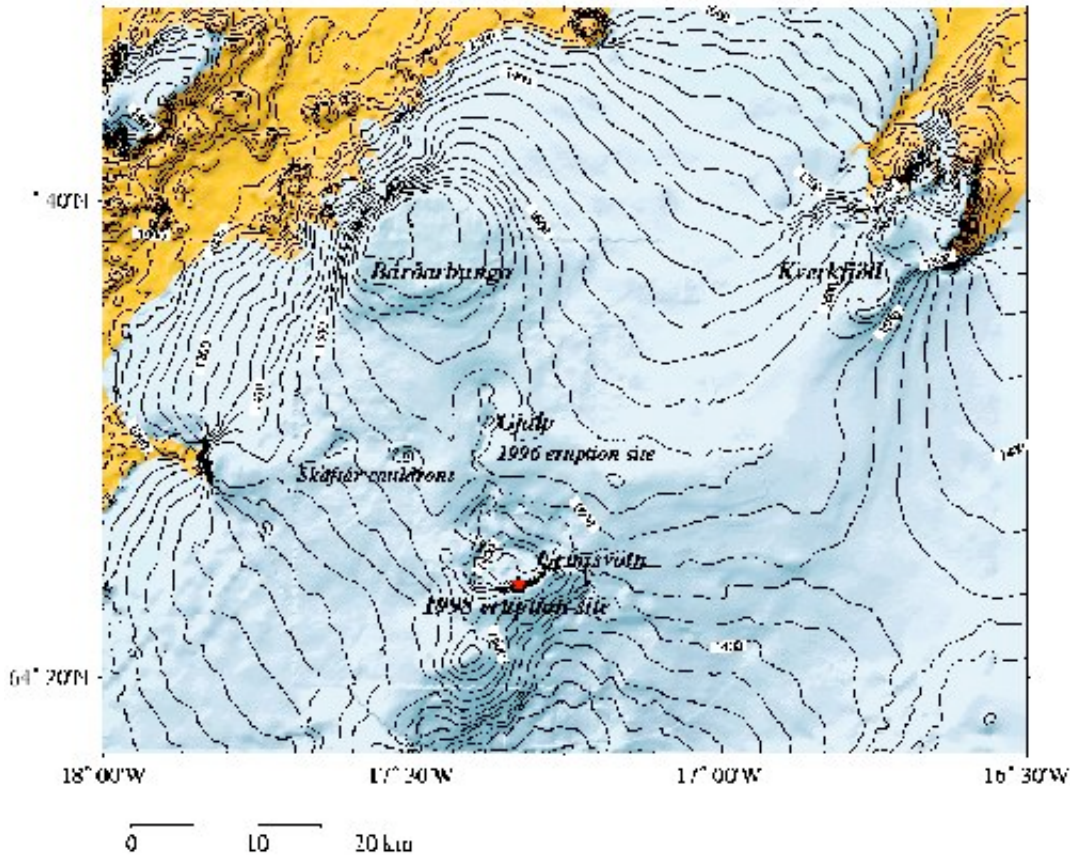
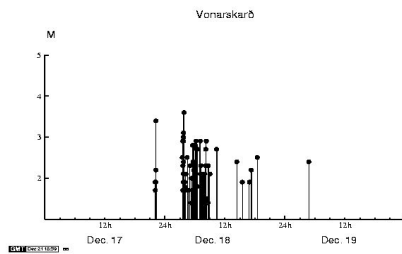


# The Dec. 18 - Dec. 28, 1998 Grímsvötn eruption



On December 18 at 09:20 GMT, an eruption began at the southern caldera rim of the Grímsvötn caldera, in Vatnajökull, Europe's largest glacier. During the first days, five craters were active along a 1300 m long fissure, striking EW along the caldera rim, in similar place as the 1983 and 1934 eruption sites.

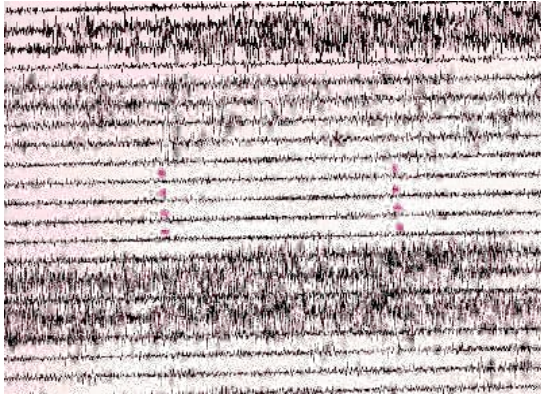
This home page presents an overview of the Gjalp 1996 and Grímsvötn 1998 eruptions along with a scientific introduction to the Vatnajökull region.



Magnitudes of earthquakes prior to and at the beginning of the eruption. The magnitudes are derived from coda length (tau) at the Vonarskarð station, which is situated 35 km northwest of the eruption site.

The Dec. 18, 1998 earthquake swarm is smaller but strikingly similar to the swarm which preceeded the May 28, 1983 eruption in Grímsvötn. As during the past few months, a marked increase in seismicity was

observed in the Grímsvötn region prior to the 1983 eruption. A magnitude 2.9 earthquake at 02:30h on May 28, 1983 marked the beginning of a dense earthquake swarm which lasted nine hours, during which 18 earthquakes reached magnitude 3 and above (Einarsson and Brandsdóttir, Jökull, 1984).



A Dec. 19. seismogram from the station at Grímsfjall, located at the caldera rim, less than 3 km from the eruption site. Red dots denote minute marks. The top mark on the left is at 10:56 and the lowest mark on the right at 11:27 hours. Each line thus represents close to 2.5 minutes of recording time whereas individual lines are 10 minutes apart. Continuous tremor dominates the seismogram, making it necessary to lower the station gain from 30 dB to 6 dB (i.e. 16 times). Superimposed on the continuous volcanic tremor are individual tremor bursts lasting 5-20 minutes which most likely reflect variations in explosive activity at the eruption site.

Continuous tremor at a frequency range close to 3 Hz has been observed during all recent eruptions in Iceland (i.e. Krafla 1975-1984; Hekla, 1980, 1981, 1991; Gjalp 1996; Grímsvötn, 1983, 1998). The eruption tremor has a fairly constant amplitude which is directly related to the vigor of the eruption, lava production and gas release. Tremor bursts have, however, only been observed in association with subglacial eruptions and are most likely generated in the forceful struggle between the submerged eruption vents and the surrounding meltwater.

#### **Dec. 26, 1998; at 13h GMT**

The eruption tremor has been gradually decreasing during the last days. The station gain at Grímsfjall is now 12 dB, which is 8 times lower than the average gain at this station.

#### **Dec. 28, 1998; at 18:30h GMT**

No eruption tremor or tremor bursts have been detected at the Grímsfjall station since 14h today. The gain of this station, which is located less than 3 km from the eruption site is now back to normal. Although one cannot confirm it, at this time, the seismometer indicates that the eruption has finished.

#### **Dec. 29, 1998; at 19 h GMT**

The eruption has finished.

#### **[Other maps of Vatnajökull](#)**

The region, earthquake activity, glacier surface, and the bedrock under the glacier as determined by echo soundings.

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## [Abstracts of research papers related to the Gjálp 1996 and Grímsvötn, 1983 eruptions](#)

### Links in English

- [MBL 1998](#) Morgunblaðið newspaper, photographs of the new eruption (click on myndir as text is in Icelandic.)
- [MBL 1996](#) Some of the best photos from the 1996 eruption and the jökulhlaup, published by the Morgunblaðið newspaper.
- [Nordic Volcanological Institute](#) -- photographs, chemical analyses and commentary.
- [HALO, Laboratory for Oceanic and Atmospheric Sciences](#) offers a graphical weather forecast, including high-altitude winds.
- [Satellite photos](#), of Vatnajökull from the Tromsø Satellite Station.

### Links in Icelandic

- [Almannavarnir Ríkisins](#) The Icelandic Civil Defense.
- [Jarðeðlissvið Veðurstofu Íslands](#). The Icelandic Meteorological Office.
- [Eldsmiðurinn](#), Hornafirði.

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## Subglacial Volcanic Eruption in Gjálp, Vatnajökull, 1996



On September 30, 1996 a volcanic eruption started underneath Vatnajökull. This thunderous fight of fire and ice makes for one of nature's most dramatic spectacles.

### Chronological accounts of the 1996 events

- [The eruption](#)
- [The jökulhlaup](#)

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### Photographs of the 1996 eruption and jökulhlaup

- [The eruption](#) from Oct 1 - Oct 3 (Click on an image to get an enlarged version.)
- [More photos from eruption](#) from Oct 9 - Oct 17.
- [Photos from the jökulhlaup](#)

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## Links to other sources

The most [detailed compilation of links related to the 1996 eruption](#) can be found at the page constructed by Ed Jackson, Dept. of Earth and Atmospheric Sciences, of University of Alberta. It also includes links related to previous eruptions in Iceland.

Other links:

- [MBL](#) Morgunblaðið newspaper, photographs (click on myndir as text is in Icelandic.)
- [Nordic Volcanological Institute](#), with images and commentary, as mirrored at the Michigan Technological University. The [original page in Iceland - has new photos of the Dec. 18, 1998 eruption](#) is probably slower for most.
- [Photos](#) from Oct 3. 1996 at Iceland Review.
- [Scott Polar Research Institute, University of Cambridge](#).
- [German Aerospace Research](#), with interpretations of remote sensing data.
- Photos at [Air Charter Inc.](#).
- [The Volcano Show](#), by the filmmaker Villi Knudsen.
- A good summary page at Princeton named [Eruption 96 - Iceland](#)

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*The number of times this page has been accessed:*

Last updated: Dec. 29, 1998.

Please send comments about this web-page to: Magnus M. Halldórsson (mmh at hi dot is), and direct scientific correspondence to Bryndís Brandsdóttir (bryndis at raunvis dot hi dot is).